

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the application of:

Masayuki TSUTSUMI et al.

Serial No.: 10/584,398

Filing Date: July 5, 2007

For: POLYIMIDE FILM

Examiner: Shane Fang

Group Art Unit: 1766

Confirmation No. 9225

APPELLANTS' REPLY BRIEF

MS Appeal Brief – Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This reply brief responds timely to the new issues raised in Examiner's Answer dated November 10, 2010.

Appellants note with thanks the withdrawal of the rejections of claims 1-4, 6, 11, 13, 14 and 17. As a result, only claims 5, 7-9, 15, 16, 18 and 19 are before the Board on this appeal. Appellants supply herewith a revised Appendix setting forth the claims currently on appeal.

The issues remaining for the Board to decide are:

- Whether claims 5 and 18 were properly rejected as anticipated by Dalman.
- Whether claims 5 and 18 were properly rejected as anticipated by Harris.
- Whether claims 7-9, 15, 16 and 19 were properly rejected under 35 USC 103(a) on Harris alone.

ARGUMENT

- A. The Examiner has significantly shifted the grounds on which the anticipation rejections rest, to the point that Appellants do not have reasonable notice of the Examiner's rationale for rejection.**

On pages 8-11 of the Answer the Examiner states, "The Examiner has withdrawn the inherency rationale for the previous 102 rejections of claims 5 and 18 over [Dalman and Harris]." The Examiner instead states, "The examiner has maintained and clarified the product-by-process rationale for the previous 102 rejections of claims 5 and 18 over [Dalman and Harris]." The problem here is that the final rejections of claims 5 and 18 as anticipated by Dalman and Harris, which incorporated by reference the discussion of the Dalman and Harris references set forth in the first Action on the merits, dated June 23, 2009, do not rely on a "product-by-process rationale" that is separate from the inherency rationale now abandoned by the Examiner in the Answer. Appellants thus do not have a reasonable basis on which to understand why claims 5 and 18 have been rejected as anticipated by Dalman and Harris.

The rejection in the first Action of claims 5 and 18 as anticipated by Dalman reads as follows (Action of June 23, 2009, at pages 2-3):

Claims 5 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dalman (US 5670262) listed on IDS.

As to claim 5, a product-by-process claim, Dalman discloses a polyimide film obtained by reacting pyromellitic dianhydride with 5-amino-2-(p-aminophenyl) benzoxazole (Abs., Ex. 1) and cured to polyimide of 51 μm , falling within the range of thickness of application (1-150 μm [0089]). Dalman is silent on the property of water residue measured by the method recited in claim 5. However, in view of the substantially identical composition, it appears that the adduct would have inherently possessed the claimed properties. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. *In re Best*, 562 F. 2d 1252, 195 USPQ 430 (CCPA 1977). See MPEP § 2112. In this particular case, the polyimide film disclosed by Dalman shows no structural and chemical difference from the polyimide film recited in claim 5. As a result, the disclosed polyimide film would inherently possess the property of water residue.

As to claim 18, Dalman discloses PWB having a layer of polyimide containing benzoxazole moiety (Abs.).

As the Board can see, the only reference to a "product-by-product rationale" underlying this rejection is the brief mention of claim 5 as being a product-by-process claim. Appellants respectfully submit that there is no "product-by-process rationale" for rejecting claims 5 and 18 as anticipated separate from the inherency rationale already abandoned by the Examiner. Whether a claim is a product-by-process claim goes to how such a claim is to be construed, not to how the prior art is to be applied to that claim.

The reasoning underlying the rejection of claims 5 and 18 as anticipated by Harris is basically the same and expressly relies on the Examiner's rationale for the rejection on Dalman (Action of June 23, 2009, pages 3-4; emphasis added):

Claims 5 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Harris et al. (US 5741585) listed on IDS.

Harris et al. discloses a polyimide film obtained by reacting bisoxazole [sic, bisoxazole] containing diamine with dianhydride (Ex. 1, 3 Com Ex. A) followed by spin coating on silicon wafer and cured to polyimide having a thickness of 2.7-2.9 μm , falling within the range of thickness of application (1-150 μm [0089]).

Claim 5 is rejected again for the same rationale as applied in the above paragraph 3.

As to claim 18, Harris et al. discloses a polyimide film (base substrate) (Ex. 1, 3 Com Ex. A). Harris et al. is silent on "for printed wiring assemblies". However, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458,459 (CCPA 1963). See MPEP 2111.02. In this particular case, it appears there is no difference between the base substrate in the reference and the one in claims 18, and the polyimide base substrate of Harris is clearly capable of being used for printed wiring assemblies.

Accordingly, if the Examiner has indeed withdrawn the inherency rationales for the rejections of claims 5 and 18 as anticipated by Dalman and Harris, there is nothing left of these rejections. If the Examiner maintains that these anticipation rejections still have life, then it is not apparent from the record just how and why Dalman and Harris are being used as evidence of

anticipation. Appellants respectfully submit that the final rejections of claim 5 and 18 as anticipated by Dalman and Harris have no remaining substance and should be summarily reversed.

B. Contrary to the Examiner's reasoning, claims 5 and 18 are not product-by-process claims

As Appellants have previously explained, claims 5 and 18 are directed to a polyimide film and a base substrate for printed wiring assemblies made from the film of claim 5, respectively, having a specified water evolution property, as defined in claim 5. That property is expressed in terms of the amount of water vaporized at a high temperature during heating at 500°C for 10 sec of the film immediately after helium purge at 170°C for 7 min and preliminary drying is not more than 5000 ppm. The Examiner takes the position in the Answer that claims 5 and 18 are properly rejected as anticipated by Dalman and Harris because they are product-by-process claims. This view is based on a fundamental misunderstanding of what product-by-process claims are. The recitation of the water evolution property in claims 5 and 18 does not make them product-by-process claims.

As Appellants previously explained, claim 5 is a product-by-process claim except for the "wherein" clause, which specifies the water evolution property, a physical property of the product of claim 5 separate from the steps employed to make it. As implied by the case law cited in MPEP 2113, a product-by-process claim is a claim that defines a product in terms of the process used to make the product. The water evolution property defined in the "wherein" clause of claim 5, which the Examiner dismisses as being a product-by-process recitation, is not defined in terms of how the film is made by instead by reference to the manner in which the test for the water evolution property is carried out. This may be seen clearly from paragraph [0086], which explains the test method by which the water evolution property is ascertained. The rejections of claims 5 and 18 overlook this physical property and provide no reasoned basis from which to conclude that the Dalman and Harris references disclose films that possess this characteristic.

Since the Examiner has abandoned his inherency rationale, this is another reason why the rejections of claims 5 and 18 as anticipated by Dalman and Harris should be reversed.

C. The obviousness rejection of claims 7-9, 15, 16 and 19 on Harris alone is based on an improper application of inherency and should be reversed

1. The obviousness rejection is legally untenable

The Examiner rejected none of the claims subject to this obviousness rejection as anticipated by Harris, the logical consequence of which is that the Examiner has admitted from the outset that Harris does not identically disclose, either expressly or inherently, the subject matter of any of the claims rejected as obvious over Harris alone. Now that the Examiner has abandoned his inherency rationale for relying on Harris as evidence of anticipation of claims 5 and 18, the maintenance of this obviousness rejection makes even less sense than before.

At pages 10-11 of the Answer, the Examiner says:

The examiner has provided reasoning to support the use of inherency rationale by comparing the similar process of Harris and the present invention, which is to obtain the claimed surface planar orientation degree of substrate surface and air surface of the claimed polyimide films recited in claim 7 and surface planar orientation recited in claim 8 by controlling the solvent residue of green film of polyamic acid precursor. Harris et al. discloses a solvent residue range of 10-35% that sufficiently overlaps with the range of the present invention of more than 25%. The examiner has applied and maintained the overlapping rationale. Consequently, the inherency rationale has been applied and maintained to meet the claimed properties of claims 7-9, 15-16 and 19.

However, the Examiner has never averred that Harris inherently discloses the subject matter of any of the claims subject to the obviousness rejection, only that the claims overlap some of the parameters disclosed by Harris. Therefore, the Examiner's reliance on an inherency rationale to support this obviousness is not only a new approach, it has no factual basis in view of the Examiner's failure to provide a reasoned technical basis for believing that the allegedly obvious features of the claims would have been apparent to persons of ordinary skill in the art from Harris alone. The Examiner did not respond to, and thus did not rebut, Appellants' extensive discussion of the principles controlling the use of alleged inherent disclosure to support an

obviousness rejection, as set forth in MPEP 2141.02.V., “Obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993).” The Examiner does not even allege that persons of ordinary skill in the art would have recognized the existence of the alleged inherent disclosure in Harris at the time Appellants’ invention was made.

2. The Examiner’s use of Harris to support the obviousness rejection is factually erroneous

The Examiner argues at page 10 of the Answer, as quoted above, with regard to claim 7 that Harris discloses a range of solvent residue in the green film which is allegedly similar to the claimed range. However, Harris provides no reason for a person of ordinary skill in the art to arrive at the claimed relationship between the solvent residue range of the green film and the surface planar orientation degree of the film because Harris does not disclose or suggest that any such relationship exists. Furthermore, as explained in paragraph [0066] of this application, the means for achieving the characteristics set forth in claims 7-9, 15, 16 and 19 is not solely the control of the solvent residue range: “[T]he conditions for drying to give a self-supporting green film are controlled, whereby a green film showing a small difference in the surface planar orientation degree between the front and the back can be obtained.” The Examiner is relying on Appellants’ own disclosure as evidence of obviousness, which is prohibited. Consequently, the final rejection of claims 7-9, 15, 16 and 19 on Harris alone must be reversed on this additional ground.

CONCLUSION

For the foregoing reasons, and the reasons stated in Appellants’ Opening Brief, the final rejection of claims 5, 7-9, 15, 16, 18 and 19 should be reversed.

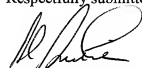
In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, appellants petition for any required relief including extensions of time and authorize the Commissioner to charge

the cost of such petitions and/or other fees due in connection with the filing of this document to
Deposit Account No. 03-1952, referencing docket no. 358362011300.

Respectfully submitted,

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By:



Barry E. Bretschneider
Registration No. 28,055
Morrison & Foerster LLP
1650 Tysons Boulevard, Suite 400
McLean, Virginia 22102
Telephone: (703) 760-7743
Facsimile: (703) 760-7777

REVISED APPENDIX OF CLAIMS ON APPEAL

5. A polyimide film obtained by reacting an aromatic diamine having a benzoxazole structure with an aromatic tetracarboxylic acid anhydride to produce a polyamide acid solution, drying the polyamide acid solution to produce a self-supporting green polyamide acid film, passing the green film through a nitrogen purged continuous type heat treatment furnace to heat the green film to carry out an imidation reaction and cooling the produced film to room temperature to give the polyimide film,

wherein the amount of water vaporized at a high temperature during heating at 500°C for 10 sec of the film immediately after helium purge at 170°C for 7 min and preliminary drying is not more than 5000 ppm.

7. A polyimide film obtained by reacting an aromatic diamine having a benzoxazole structure with an aromatic tetracarboxylic acid anhydride, wherein the absolute value of the difference between a surface planar orientation degree of one surface (surface A) and a surface planar orientation degree of the other surface (surface B) of the film is 0-2.

8. The polyimide film of claim 7, wherein the surface planar orientation degree of the film surface having a higher surface planar orientation degree is not more than 15.

9. The polyimide film of claim 7, which has a curling degree of 0%-5%.

15. The polyimide film of claim 7, wherein the ratio (ϵ_{65}/ϵ_D) of the dielectric constant ϵ_{65} at 100 GHz of the film humidity-conditioned under a constant temperature and humidity conditions of 20°C, 65% RH for 94 hr, as measured by the cavity resonance perturbation method, to the dielectric constant ϵ_D at 100 GHz of the film vacuum dried under the conditions of 120°C, for 24 hr, as measured by the cavity resonance perturbation method, is within the range of 1.00-1.10.

16. The polyimide film of claim 8, which has a curling degree of 0%-5%.

18. A base substrate for printed wiring assemblies, which comprises the polyimide film of claim 5.

19. A base substrate for printed wiring assemblies, which comprises the polyimide film of claim 7.